

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION**

<b>VIVIAN BERT, et al.,</b>	)	<b>CASE NO. C-1-02-467</b>
	)	
<b>Plaintiffs,</b>	)	<b>Judge Sandra S. Beckwith</b>
	)	<b>Magistrate Judge Timothy S. Hogan</b>
<b>v.</b>	)	
	)	
<b>AK STEEL,</b>	)	
	)	
<b>Defendant.</b>	)	

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**REBUTTAL EXPERT REPORT**  
**REGARDING HIRING INTO LABORER POSITIONS**  
**AT THE MIDDLETOWN WORKS AND ASHLAND WORKS OF AK STEEL**  
**EDWIN L. BRADLEY, Ph.D.**

I am the CEO and founder of Quantitative Research Associates (“QRA”). QRA provides statistical and computing consulting services. I have applied statistical methodology in the fields of litigation, medical research and business applications for over 38 years. I have been accepted as an expert witness in both State and Federal Courts on a variety of issues, including employment discrimination. I am an author of over 215 publications and research papers. My work has appeared in scientific journals such as *American Statistician*, *Journal of the American Statistical Association*, *IMA Journal of Mathematics Applied in Business and Industry*, and *Technometrics*. I received my Ph.D. in statistics from The University of Florida in 1969. I was a tenured Professor in the Department of Biostatistics at The University of Alabama at Birmingham (“UAB”), where I taught and conducted research for 28 years. I am currently Professor Emeritus of Biostatistics at UAB.

## **Introduction**

I previously filed an Expert Report on March 1, 2005 (“Bradley Report”) and a Supplemental Expert Report on April 18, 2005 (“Bradley Supplemental Report”) that examined the racial composition of the hiring selections for the Laborer positions at AK Steel’s Middletown, Ohio Works and Ashland, Kentucky Works<sup>1</sup> (collectively “AK Steel”) for the period from January 1, 2000 through December 31, 2002. Counsel for the plaintiffs has asked me to respond to Defendant’s *Report of Mary Dunn Baker, Ph.D.*, dated May 25, 2005 (“Baker Report”).

## **Summary of Conclusions**

Based on my review of the Baker Report, and my analyses, I have reached the following conclusions:

- I have not improperly included applicants or hires in my analyses. It is my understanding that the class in this case would at least consist of all African-Americans potentially affected by the hiring process for Laborer positions from January 1, 2000<sup>2</sup> to the present;<sup>3</sup>
- I have used the correct statistical method (a generalized binomial) for my analyses, which incorporates a finite population correction factor, and it is not inappropriate as Dr. Baker states in her Report;
- Dr. Baker’s methodology is incorrect in that she does not adjust for selections made from a finite population;
- I have correctly used a one-sided criteria for statistical significance,<sup>4</sup> although all of my results are also statistically significant under the two-sided criteria for significance of “two or more standard deviations”;
- I correctly analyzed the electronic Ashland data file<sup>5</sup> provided by the Defendant during discovery in this case and have counted all applicants and hires listed therein;

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<sup>1</sup>The Ashland Works consist of two facilities – the Coke Works and the West Works.

<sup>2</sup>My understanding regarding the liability period in this case is based on statements from plaintiffs’ counsel.

<sup>3</sup>I had only received applicant data and/or hardcopy documentation from January 1, 2000 through October 29, 2003 at the time of my earlier Reports. Therefore, my analyses are within my understanding of the liability period for this case. If data up to the present were provided to me, my analyses regarding statistical significance and/or adverse impact could increase or decrease accordingly. If updated data is provided by the defendant, I will supplement my Report as necessary.

<sup>4</sup>See Bradley Supplemental Report, pp. 3-5, for a discussion of the appropriateness of using one-sided criteria for these types of analyses.

<sup>5</sup>Electronic file “Ashland App Flow (no ssn) (W0377464).xls” (“AK Steel Ashland Data”) containing application and hiring information for the Ashland, Kentucky Works for the period October 24, 2000 through November 18, 2002. It is my understanding that this electronic file contained applicants and hires for Laborer positions at Ashland.

- Ashland Hardcopy<sup>6</sup> data, though it contained hires and applicants during the relevant time period, could not be utilized in the Bradley Supplemental Report because race was unknown for over 30% of the applicants and it was incomplete regarding the identification of selections for positions;<sup>7</sup>
- Ashland Image<sup>8</sup> data, though it contained hires and applicants during the relevant time period, could not be utilized in the Bradley Supplemental Report because 82% of the applicants were missing race information;<sup>9</sup>
- The shortfall of African-American hires computed for the Middletown Works analyses in both the Bradley Report and the Bradley Supplemental Report is not exaggerated because I have correctly included all relevant applicants when looking at the total selection process, as defined in the *Uniform Guidelines*;<sup>10</sup>
- My analysis of the total selection process based on the same Middletown data as utilized in the Baker Report results in a finding of adverse impact against African-Americans in the hiring process used by AK Steel for filling Laborer positions for the period January 1, 2000 through December 31, 2003;
- Dr. Baker's own analysis of the total selection process based on the Middletown data utilized in her Report results in a finding of adverse impact against African-Americans in the hiring process used by AK Steel for filling Laborer positions for the period August 12, 2001 through December 31, 2003;<sup>11</sup>
- My analysis of the total selection process based on the same Ashland data as utilized in the Baker Report results in a finding of adverse impact against African-Americans in the hiring process used by AK Steel for filling Laborer positions for the period January 1, 2000 through December 31, 2003;
- My analysis of the same Middletown data as utilized in the Baker Report results in a finding of adverse impact against African-Americans for the written test used by AK Steel for filling Laborer positions at its Middletown and Ashland Works, and is the primary explanation of the hiring shortfall for Laborer positions;
- My analysis of the same Middletown data as utilized in the Baker Report contradicts Dr. Baker's conclusion that the "... Middletown hiring shortfall is explained by the fact that African-Americans were more likely than others to fail the background check and physical..."; and
- It is still my opinion that the hiring process used by AK Steel for filling Laborer positions at its Middletown and Ashland Works reveals a statistically significant pattern of under-hiring African-Americans and has had an adverse impact against African-Americans applying for Laborer positions.

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<sup>6</sup> Hardcopy applications and application flow information for the Ashland, Kentucky Works produced in 13 banker boxes containing Bates numbered documents AKA-000001 through AKA-044455 ("Ashland Hardcopy Data").

<sup>7</sup> Bradley Supplemental Report, page 7.

<sup>8</sup> CD labeled "AKA03" containing over 7,500 images and index files of additional application flow information for the Ashland, Kentucky Works.

<sup>9</sup> Bradley Supplemental Report, page 7.

<sup>10</sup> *Uniform Guidelines on Employee Selection Procedures*, 29 C.F.R ("Uniform Guidelines"). See Questions and Answers, numbers 13 and 14.

<sup>11</sup> Baker Report, Tables 1.a and 1.b, show more than two standard deviations of difference.

## **Information Relyed Upon**

For the analyses and opinions contained in this Rebuttal Report, I have relied primarily on the following:

- *Report of Mary Dunn Baker, Ph.D.*, dated May 25, 2005 (“Baker Report”);
- All data utilized in the Bradley Report and Bradley Supplemental Report;
- Electronic data file ashland data.xls utilized by Mary Baker (“Baker Ashland Data”);
- Electronic data file middletown data.xls utilized by Mary Baker (“Baker Middletown Data”), covering the period January 1, 2000 through December 31, 2003;
- February 16, 2005 deposition of Susan Lester, Manager of Human Resources for the Ashland, Kentucky Works (“Lester Deposition”); and
- February 16, 2005 deposition of Phyllis Short, General Manager of Human Resources for AK Steel and previously Manager of Human Resources for the Middletown Works (“Short Deposition”).

## **Statistical Methodology**

Dr. Baker states that I “used the hypergeometric method to compute the number of standard deviations between the actual and expected number of African-American hires.”<sup>12</sup> She further states that this is “... an inappropriate statistical method.”<sup>13</sup> I did not use the hypergeometric method; rather, I used the generalized binomial method.<sup>14</sup> The generalized binomial method is similar to the binomial methodology that Dr. Baker uses, but adjusts for the fact that there is a finite pool of known applicants from which the selections (hires) were made by using a finite population correction factor.<sup>15</sup>

The binomial methodology used by Dr. Baker is appropriate only when there is a proxy estimate of the racial composition of the applicant pool from an independent source (such as Census data), and the size of the applicant pool is unknown. However, in this case, the actual racial composition of the

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<sup>12</sup> Baker Report, p. 7.

<sup>13</sup> Baker Report, p. 1.

<sup>14</sup> The hypergeometric and generalized binomial methodologies give very similar results, differing only by a factor of  $N/(N-1)$  where N is the number of applicants. However, the two methodologies are very different in definition and application.

applicant pools is known, as well as the number of applicants. Thus, Dr. Baker uses an inappropriate statistical methodology in her analyses of the total selection process for the Middletown and Ashland Works based on the Baker Middletown Data and the Baker Ashland Data.

### **Analysis of Hiring at the Middletown Works Using Baker Data**

Chart 1 illustrates the percentage of African-Americans included in the applicant pool at each stage of the hiring process at the Middletown Works. Table 1 summarizes my analyses of the total selection process, as well as the testing component of the hiring process, at the Middletown Works. These analyses of the same data files utilized by Dr. Mary Baker in her Report cover the period from January 1, 2000 through December 31, 2003.

#### *Summary of Components of the Selection Process*

Chart 1 illustrates the percentage of African-Americans remaining after each stage of the hiring process for Laborer positions at the Middletown Works. The individual stages are: Application,<sup>15</sup> Internal Screening, Written Test, Interview, Background Check, Physical, and Hire. It is clear from this chart that the written test has the largest impact on African-American applicants in the hiring process. The written test reduces the representation of African-Americans in the applicant pool by one-third, and, as shown below, this reduction is statistically significant. Another component that has a slight impact, although not statistically significant, is the background check. From Chart 1, it is clear that the Middletown hiring shortfall is explained by the fact that African-Americans were more likely than others to fail the written test and, as a result, to become ineligible for hire. Dr. Baker is incorrect when she says that the "... Middletown hiring shortfall is explained by the fact that

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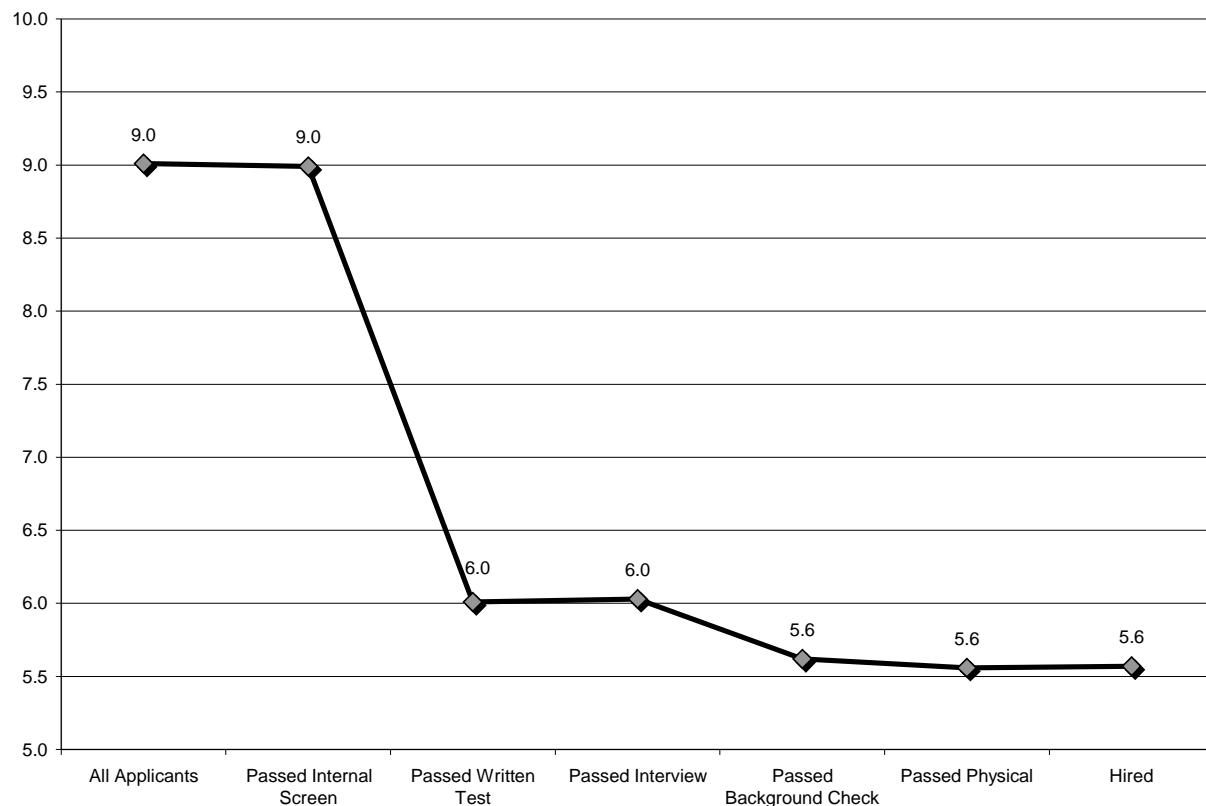
<sup>15</sup> However, *arguendo*, even if I were to use the binomial methodology advocated by Dr. Baker, the results of Table 1-A in the Bradley Supplemental Report would show four standard deviations of difference for the shortfall of African-Americans hired into Laborer positions at AK Steel.

<sup>16</sup> There is an initial external screening of applicants by the Ohio Bureau of Employment for the Middletown Works (Short Deposition, pp. 56-57, 60) and by the Kentucky Bureau of Employment for the Ashland Works (Lester Deposition, pp. 29-30, 34-35). However, AK Steel has no record of any applicant excluded by this external screen. Thus, "application" as used in this Report refers only to those applicants that have passed this external screening.

African-Americans were more likely than others to fail the background check and physical... ."<sup>17</sup>

The background check and physical only account for an additional 4.4% reduction in the African-American representation in the applicant pool, and are not statistically significant. Based on these facts, the hiring shortfall analyses in my earlier Reports were not exaggerated by including applicants who failed to successfully complete the background check or physical exam.

**Chart 1. Percentage of African-Americans Remaining After Each Stage of the Hiring Process for Laborer Positions at the Middletown Works – Baker Data**



Dr. Baker also criticizes my analyses for including applicants that she says have voluntarily withdrawn from the hiring process. However, as stated in the depositions of Phyllis Short and Susan Lester, there are no set procedures in place at AK Steel regarding the number of attempts that must be made to reach an applicant to set them up to be tested, nor is there any attempt made to reach an

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<sup>17</sup> Baker Report, p. 13.

applicant by mail to set them up for testing.<sup>18</sup> Thus, if an applicant fails to appear for a test at AK Steel, it may not be a voluntary decision. Rather, it may simply be because AK Steel failed to inform them that they were scheduled to take the test.

#### *Analysis of the Total Selection Process*

Table 1 shows the results of my analyses of the total selection process for hiring into Laborer positions at the Middletown Works for the period from January 1, 2000 through December 31, 2003, using the Baker Middletown Data. The benchmark for the total selection process is the percentage of African-American applicants for these positions contained in the Baker Middletown Data.<sup>19</sup>

Fewer African-Americans than expected were hired. There were a total of 844 hires during the period from January 1, 2000 through December 31, 2003, of which 47 were African-American. If race were not a factor in the selection process, 9.0%, or approximately 76, of the hires would have been African-American. There were approximately 29, or 38.2%, fewer African-Americans hired than expected during the period analyzed. This shortfall is statistically significant with -3.71 standard deviations of difference. The adverse impact ratio is 59.5%, which is less than the 80% allowed under the *Uniform Guidelines*.

#### *Analysis of the Testing Component of the Hiring Process*

Table 1 also shows the results of my analyses of the testing component of the hiring process for Laborer positions at the Middletown Works for the period from January 1, 2000 through December 31, 2003, using the Baker Middletown Data. The benchmark for the testing component is the percentage of African-American applicants who successfully passed AK Steel's internal screening of applicants.

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<sup>18</sup> Lester Deposition, pp. 59-60 and Short Deposition, pp. 23-26.

<sup>19</sup> My analyses only use applicants of known race and one application per applicant. There were 226 (3.0%) of the applicants for which the race could not be determined.

Fewer African-Americans than expected passed the test. There were a total of 1,896 applicants who passed the test during the period from January 1, 2000 through December 31, 2003, of which 114 were African-American. If race were not a factor in the selection process, 9.0% of the successful applicants, or approximately 170 individuals, would have been African-American. There were approximately 56, or 33.1%, fewer African-Americans who passed the test than expected during the period analyzed. This shortfall is statistically significant with -6.10 standard deviations of difference. The adverse impact ratio is 64.8%, which is less than the 80% allowed under the *Uniform Guidelines*.

**Table 1. Analysis of Middletown Hires for the Period January 1, 2000 Through December 31, 2003 – Baker Data**

Component	Percent A-A Benchmark	Actual Total Selected	Expected A-A Selected	Actual Minus Expected	Number of Standard Deviations	Adverse Impact Ratio
Testing	8.99	1,896	114	170.45	-56.45	-6.10
Total Selection Process	9.01	844	47	76.06	-29.06	-3.71

Based on the above analyses, it is my opinion that the hiring process utilized by AK Steel for Laborer positions at its Middletown Works has had an adverse impact against African-Americans applying for these positions for the period from January 1, 2000 through December 31, 2003. Additionally, it is my opinion that the written test utilized by AK Steel has had an adverse impact against African-Americans at both the Middletown and Ashland Works.<sup>20</sup>

#### **Analysis of Hiring at the Ashland Works Using Baker Data**

In her analyses of the total selection process at the Ashland Works, Dr. Baker uses data (Baker Ashland Data) which is missing racial information for over 28% of the applicants. Moreover,

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<sup>20</sup>The testing component is also directly applicable to the applicants for the Ashland Works, since the same test is used for both the Middletown and Ashland Works. See Lester Deposition, pp. 69-71 and Short Deposition, pp. 27-30.

while Dr. Baker comments negatively about my failure to use similar data (Ashland Hardcopy Data), which is missing racial information for over 30% of the applicants, she states that this data, “...should not be ignored as *there is no reason to believe that the use of this information would result in an understatement of African-American representation among applicants for these jobs.*”<sup>21</sup> (Emphasis added.) Contrary to this statement by Dr. Baker, I believe that her use of the Baker Ashland Data gives rise to an improper benchmark and a corresponding understatement of African-American representation among the applicants at the Ashland Works. As seen in Table 2 below, the electronic application data provided by AK Steel for its Ashland Works (AK Steel Ashland Data) reflects African-American representation in the applicant pool at 8.56%, with only 6.4% of these applicants having an unknown race,<sup>22</sup> more than four times smaller than the 28.4% of applicants with unknown race (and more than double the African-American benchmark of 3.20%) contained in the Baker Ashland Data. Based on these facts, I believe that Dr. Baker, by using the Baker Ashland Data, has grossly underestimated the percent of African-Americans in the applicant pool for the Laborer positions at the Ashland Works.<sup>23</sup>

**Table 2. Comparison of Unknown Race and African-American Benchmarks**

Data Source	Period Covered	Percent Unknown Race	Percent African-American Applicants <sup>a</sup>
AK Steel Ashland Data	10/24/00 – 9/17/02	6.4%	8.56%
Baker Ashland Data	1/1/00 – 12/31/03	28.4%	3.20%

<sup>a</sup> Among applicants of known race.

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<sup>21</sup> Baker Report, p. 8.

<sup>22</sup> Dr. Baker criticizes my analysis for including applicants that were contained in the AK Steel Ashland Data that she says were applying for skilled positions. However, as she acknowledges in her Report, those applicants are also considered for Laborer positions. (Baker Report, p. 8 and footnote 16.)

<sup>23</sup> Dr. Baker’s further use of the census data to verify her choice of her benchmark, particularly where a large proportion of the applicants have unknown race, is inappropriate in the light of the existence of more complete and reliable applicant data (AK Steel Ashland Data) for determining the racial composition of the applicants at the Ashland Works.

### *Analysis of the Total Selection Process*

Although the Baker Ashland Data has many flaws, it does contain the race of all applicants “hired” into Laborer positions during the period from January 1, 2000 through December 31, 2003. Therefore, I have decided to use the Baker Ashland Data to determine the hires at the Ashland Works during the period from January 1, 2000 through December 31, 2003. The appropriate benchmark for this total selection process is 8.56%, the representation of African-Americans among applicants of known race for these positions as reflected in the AK Steel Ashland Data.<sup>24</sup> Table 3 shows the results of my analysis of the total selection process for hiring into Laborer positions at the Ashland Works for the period from January 1, 2000 through December 31, 2003, using both the Baker Ashland Data and the AK Steel Ashland Data.

Fewer African-Americans than expected were hired. There were a total of 289 hires during the period from January 1, 2000 through December 31, 2003, of which 12 were African-American. If race were not a factor in the selection process, 8.6%, or approximately 25, of the hires would have been African-American. There were approximately 13, or 51.5%, fewer African-Americans hired than expected during the period analyzed. This shortfall is statistically significant with -2.81 standard deviations of difference. The adverse impact ratio is 46.3%, which is less than the 80% allowed under the *Uniform Guidelines*.

**Table 3. Analysis of Ashland Hires for the Period January 1, 2000 Through December 31, 2003 – Baker Data**

Component	Percent A-A Benchmark	Actual Total Selected	Expected A-A Selected	Actual Minus Expected	Number of Standard Deviations	Adverse Impact Ratio
Total Selection Process	8.56	289	12	24.74	-12.74	-2.81

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<sup>24</sup> Analysis uses only one application per applicant.

Based on the above analysis, it is my opinion that the hiring process utilized by AK Steel for Laborer positions at its Ashland Works has had an adverse impact against African-Americans applying for these positions for the period from January 1, 2000 through December 31, 2003.

*Analysis of the Testing Component of the Hiring Process*

Individual components of the hiring process are not available for the Ashland Works. However, the testing procedure is the same at both the Ashland Works and the Middletown Works as both facilities use a written test developed by Resource Associates of Knoxville, Tennessee.<sup>25</sup> As shown above in my analyses of the Baker Middletown Data, the written test has had an adverse impact against African-American applicants. Since the same test and testing procedure are used at the Ashland Works, the results of my analysis of the testing component for the Middletown Works also applies to the Ashland Works. That is, the test used by AK Steel has had adverse impact against African-American applicants for Laborer positions at the Ashland Works during the period from January 1, 2000 through December 31, 2003.

**Aggregation of the Results of the Ashland and Middletown Analyses Using Baker Data**

Table 4 shows the results of my analyses of the total selection process for hiring into Laborer positions at AK Steel, aggregating the results of my analyses of the Baker Data for the Middletown Works (Table 1) and the Ashland Works (Table 3) for the period from January 1, 2000 through December 31, 2003. Fewer African-Americans than expected were hired. There were a total of 1,133 hires during the period from January 1, 2000 through December 31, 2003, of which 59 were African-American. If race were not a factor in the selection process, 8.9%, or approximately 101, of the hires would have been African-American. There were approximately 42, or 41.5%, fewer African-Americans hired than expected during the period analyzed. This shortfall is statistically significant

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<sup>25</sup> Lester Deposition, pp. 69-71 and Short Deposition, pp. 27-30.

with -4.62 standard deviations of difference. The adverse impact ratio is 56.3%, which is less than the 80% allowed under the *Uniform Guidelines*.

**Table 4. Aggregation of the Analyses of the Total Selection Process of Ashland and Middletown Hires for the Period January 1, 2000 Through December 31, 2003 – Baker Data**

Location	Percent A-A Benchmark	Actual Total Selected	Expected A-A Selected	Actual Minus Expected	Number of Standard Deviations	Adverse Impact Ratio
Ashland	8.56	289	12	24.74	-12.74	-2.81
Middletown	9.01	844	47	76.06	-29.06	-3.71
Combined	8.90	1,133	59	100.80	-41.80	-4.62

Based on the above analyses, it is my opinion that the hiring process utilized by AK Steel for Laborer positions has had an adverse impact against African-Americans applying for these positions for the period from January 1, 2000 through December 31, 2003.

#### **Baker Report Demonstrates Adverse Impact in the Hiring Process at AK Steel**

In Tables 5 and 6 below, I have presented the results of Dr. Baker's analyses from Tables 1.a and 1.b of her Report showing the racial composition of the Laborer hires at AK Steel during the period from August 12, 2001 through December 31, 2003.<sup>26</sup> I have computed the overall African-American benchmark and the adverse impact ratios, and added these to Dr. Baker's tables. Since all of my analyses were conducted using one application per applicant, the results of Dr. Baker's Table 1.b and my Table 6 below are analogous to the types of results I have presented in this Report and my earlier Reports. I will only discuss the results shown in Table 6, as both Tables 5 and 6 demonstrate similar results.

#### *Analysis of the Total Selection Process*

Table 6 shows the results of Dr. Baker's analyses of the total selection process for hiring into Laborer positions at AK Steel for the period from August 12, 2001 through December 31, 2003.

Fewer African-Americans than expected were hired at the Middletown Works, as well as for Middletown and Ashland Works combined, with adverse impact ratios less than the 80% allowed under the *Uniform Guidelines*. At the Middletown Works, there were a total of 417 hires during the period from August 12, 2001 through December 31, 2003, of which 25 were African-American. If race were not a factor in the selection process, 9.0%, or approximately 37, of the hires would have been African-American. There were approximately 12, or 33.3%, fewer African-Americans hired than expected during the period analyzed. This shortfall is statistically significant with -2.14 standard deviations<sup>27</sup> of difference. The adverse impact ratio is 64.6%, which is less than the 80% allowed under the *Uniform Guidelines*.

For the Ashland and Middletown Works combined, there were a total of 532 hires during the period from August 12, 2001 through December 31, 2003, of which 34 were African-American. If race were not a factor in the selection process, 8.0%, or approximately 43, of the hires would have been African-American. There were approximately 9, or 20.4%, fewer African-Americans hired than expected during the period analyzed. Although this combined shortfall is not statistically significant with -1.40 standard deviations of difference, the adverse impact ratio is 78.1%, which is less than the 80% allowed under the *Uniform Guidelines*. Moreover, while not statistically significant, the combined shortfall is negative, clearly reflecting the general trend shown by my and Dr. Baker's analyses. Further, if Dr. Baker's Ashland African-American benchmark of 4.57% is replaced by the appropriate value of 8.56%, as discussed earlier in this Report, the combined African-American benchmark in my Table 6 increases from 8.03% to 8.90% and the combined number of standard deviations for both the Ashland and Middletown Works increases to a statistically significant -2.15

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<sup>26</sup> Dr. Baker performs her analyses over a shorter period of time than mine based on instructions from defense counsel. See Baker Report, footnote 3.

with an adverse impact ratio of 69.9%.

**Table 5. Analysis of the Racial Composition of Laborer Hires. All Applications Submitted August 12, 2001 – December 31, 2003. (Baker Report Table 1.a)**

Location	Percent A-A Among Applications	Total Number of Hires	Expected Number of A-A Hires	Actual Number of A-A Hires	Difference Between Actual and Expected	Baker Number of Standard Deviations	Adverse Impact Ratio
Ashland	4.54%	115	5.22	9	3.78	1.69	178.6%
Middletown	8.91%	417	37.17	25	-12.17	-2.09	65.2%
Combined	7.97%	532	42.38	34	-8.38	-1.35	78.9%

**Table 6. Analysis of the Racial Composition of Laborer Hires. Applications Submitted August 12, 2001 – December 31, 2003. One Application Per Applicant (Baker Report Table 1.b)**

Location	Percent A-A Among Applications	Total Number of Hires	Expected Number of A-A Hires	Actual Number of A-A Hires	Difference Between Actual and Expected	Baker Number of Standard Deviations	Adverse Impact Ratio
Ashland	4.57%	115	5.26	9	3.74	1.67	177.2%
Middletown	8.99%	417	37.48	25	-12.48	-2.14	64.6%
Combined	8.03%	532	42.74	34	-8.74	-1.40	78.1%

Based on the above analyses conducted by Dr. Baker, it is my opinion that the hiring process for filling Laborer positions at AK Steel has had an adverse impact against African-Americans applying for these positions, even if only the period from August 12, 2001 through December 31, 2003 is analyzed.

### **Concluding Remarks**

The opinions that I have expressed above are based on my education, training, teaching, research, professional consultations, publications, experience and expertise as detailed in my attached curriculum vitae, the “Information Relied Upon” materials, and my own analyses.

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<sup>27</sup> This computation is based upon a binomial methodology without incorporating a finite population correction factor. When a finite population correction factor is applied, as is appropriate in this case, the number of standard deviations increases to -2.27.

As my continuing review of the data I have been provided to date, or any additional data I may receive from the defendant, reveals additional areas of statistical analyses that need to be done, I will file supplemental reports.

*Edwin Bradley, Ph.D.*

**07-06-05**

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Edwin L. Bradley, Ph.D.

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Date